# MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF CORNELL UNIVERSITY

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## XLIV. ON THE LAPSE OF VERBAL MEANING WITH REPETITION

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It is well known that if a familiar word be stared at for a time, or repeated aloud over and over again, the meaning drops away.[1] In this paper we report the results of experiments whose aim was the determination of the number of repetitions required for monosyllabic nouns to lose their meaning.

The stimuli consisted of common nouns taken from the vocabulary of every-day life, such as *cat, box, heart, storm, fire.* These were presented auditorily, one at a time, to each of two observers: the one served first as *E* and then as *O*, while the other served first as *O* and then as *E*. A normal series consisted of 50 words, and in the total experiment there were 7 of these: a preliminary experiment, which consisted of two series at different rates of repetition, and the experiment proper, which consisted of five series at a single rate. The final series, however, was a test-series, given after an interval of two weeks to see if the observers' attitude had become stable. The rate of repetition was controlled by a soundless metronome giving seconds; and both the number of repetitions and the rate employed were, in a fashion, checked by taking the total time of an experiment by a stop-watch.

*Preliminary Experiment.* The rates of repetition employed in the two preliminary series were 2 and 3 words per sec. respectively. The rate having been announced, and the observer practised in that tempo by watching the swinging pendulum, the following instruction was given: "I am going to give you a common word and you are to repeat it aloud until it has lost its meaning. At the close of the experiment you will give a general account of the experience." The quantitative results of these preliminary series we give in Table I.

TABLE I

PRELIMINARY SERIES

| Rate per Sec. | Obs. | No. Cases | Av. No. Repetitions | Median | Av. Total Time |
|---|---|---|---|---|---|
| 2 | B | 50 | 42.3±6.2 | 39 | 22.3±12.0 |
| | W | 50 | 54.0±12.6 | 49 | 18.2± 7.1 |
| 3 | B | 50 | 30.2±5.75 | 30 | 9.7±2.3 |
| | W | 50 | 46.2±9.6 | 45 | 15.5±3.5 |

[1] E. B. Titchener, *Beginner's Psychology,* 1915, 26. See also A. Binet, *L'étude expérimentale de l'intelligence,* 1903, 73f.; A. Messer Experimentell-psychologische Untersuchungen über das Denken, *Arch. f. d. ges. Psychol.,* vii 1906, 73ff.

An inspection of the table shows that meanings drop away more readily with the faster rate of repetition. There is also with this rate a lesser variation in the number of repetitions, although the range of variation is with both rates excessive. Finally, the averages themselves are surprisingly large. This fact, taken together with the wide range of variation, may indicate either that the stimuli were not uniform, or that the attitude of the observer was extremely instable, or perhaps that both sources of error were at work. The reports of experience show, however, that the second factor was in truth the principal condition of the result. The observers, instead of taking the word with its habitual meaning upon it, undertook to 'make' it mean, to 'think about' its meaning. The consequence was an active, searching attitude, which in turn resulted in visual imagery of objects, or in a succession of verbal ideas, or in a fluctuation of the primary with other meanings.

*The Experiment Proper.* Since the experiment by its very nature demanded a passive attitude, one that would (as it were) let the stimulus have its way with the observer, we changed the instruction in the experiment proper to read: "Take the stimulus naïvely as a word, and do not 'think about' its meaning; repeat the word aloud until it has lost its meaning." We also, in these experiments, limited ourselves to a single rate of repetition, 3 words per sec., which was as fast as the syllables could comfortably be pronounced. The quantitative results are set forth in Table II.

TABLE II

AVERAGE NO. OF REPETITIONS IN FIVE SERIES. NO. WORDS IN SERIES: 50. RATE: THREE PER SEC.

| Series | Obs. | Av. No. Repetitions | Av. Time |
|---|---|---|---|
| I | B | 23.9±5.6 | 8.7±2.5 |
| | W | 32.0±8.6 | 10.7±3.5 |
| II | B | 18.1±3.3 | 6.0±2.6 |
| | W | 19.4±5.2 | 6.3±2.1 |
| III | B | 11.4±1.9 | 3.9±0.9 |
| | W | 15.7±4.3 | 4.6±1.2 |
| IV | B | 10.3±1.9 | 3.4±0.9 |
| | W | 8.7±1.8 | 2.8±0.5 |
| V | B | 11.7±2.2 | 3.8±1.0 |
| | W | 9.8±2.1 | 3.2±0.7 |

It will be noted that the immediate result of our change in instruction, as seen in Series I when compared with the preliminary series, is a decided decrease in the average number of repetitions. This decrease continues through the following series. There is also in the four series a decrease in the magnitude of the relative *m.v.* (from 23% to 18% for *B*, and from 27% to 20% for *W*). The fifth series, which (as has been said) was a test series taken after an interval of two weeks, seems to prove that in Series IV the 'practice effect' had

reached its maximum. The reports show that this 'practice effect' is principally the result of a gradual stabilization of the attitude demanded by the instruction. This result was brought about in two ways. In the first place, an habitual and typical meaning became more frequent as the series progressed. It was characterized by both *O*'s as a 'familiar feel.' There were, however, three variants of this meaning: *O* might be aware (*a*) that he 'knows the meaning of the word,' (*b*) that he 'can call up the meaning,' or (*c*) that 'the word means a certain thing and nothing else.' The last awareness apparently rests upon a conscious attitude; and since it seemed more definite than the other two, it was characterized as a 'definite familiar feel.'[2] Any one of the three seemed to satisfy the instruction, although *a* and *b* occurred more frequently for both *O*'s than *c*. Other meanings, such as imaged visual objects and verbal associations, occasionally appeared; but the tendency throughout the four series was for these to become progressively fewer, and for the 'familiar feels' to become more numerous. In the second place, there is in successive series a progressive inhibition of other, alternative and recurrent meanings in the course of a repetition. In the earlier series such a 'fluctuation' of meanings came frequently, despite all efforts on the part of *O* to take a naïve attitude. The usual case was that of sound association: *way* changed to *whey, skill* to *skillet, lie* to *lye, world* to *whirl,* etc. Occasionally also another meaning of the same word would suddenly appear: *e. g., port* was first *harbor,* but changed to *wine.* In the later series the 'fluctuations' became decidedly fewer in number. The frequency of the various kinds of meaning and of the 'fluctuations' in all five series is given in Table III.

TABLE III

TYPES OF MEANING AND FLUCTUATIONS IN SUCCESSIVE SERIES

| Series | Obs. | Familiar Feels | Def. Fam. Feels | Visual Objects | Other Words | Fluctuations | Not Classified |
|---|---|---|---|---|---|---|---|
| I | B | 25 | 2 | 1 | 15 | 7 | 0 |
| | W | 16 | 0 | 9 | 7 | 14 | 4 |
| II | B | 29 | 9 | 0 | 8 | 0 | 4 |
| | W | 20 | 7 | 2 | 7 | 7 | 7 |
| III | B | 35 | 6 | 0 | 7 | 1 | 1 |
| | W | 17 | 10 | 2 | 5 | 15 | 1 |
| IV | B | 38 | 8 | 1 | 3 | 0 | 0 |
| | W | 30 | 9 | 2 | 6 | 2 | 1 |
| V | B | 35 | 14 | 0 | 0 | 1 | 0 |
| | W | 36 | 7 | 0 | 2 | 5 | 0 |

[2]. Meanings of similar type have been reported by other investigators. See H. P. Weld, Meaning and Process as distinguished by the Reaction Method, *Titchener Commemorative Volume,* 1917, 197 ff., and references there cited.

The experience of the word, when the meaning has dropped away, is generally reported as like that of a nonsense-syllable,—a combination of sounds, neither familiar nor unfamiliar, which has no meaning other than that of mere verbal sound. Occasionally also a 'feeling of blankness' is reported. In some instances, as a result of elision of the accentuation of a vowel or consonant in rapid pronunciation, words become strange, as if they had never before been experienced.[3] There is apparently no shift from a common-sense to a psychological attitude; the sound merely loses its individual, particular, familiar meaning and becomes either a bare word among words or something strange and unknown.

The course of the experience, according to the reports, is of two kinds. The meaning may seem to die out gradually, or it may lapse suddenly after a certain number of repetitions. What exactly happens in the former case, neither *O* was able to say. The effect is probably due to the progressive insistence of the sheer sound of the word; the meaning is thus forced, as it were, into the background, and its loss in distinctness is taken to be a loss in meaning itself. On this point, however, further observations are needed.

*Conclusions.* (1) Given a stably passive attitude on the part of the observer, the meaning of a familiar monosyllabic noun repeated aloud three times per sec. drops away in about 3 to 3.5 sec. (2) There is a tendency, as practice advances, for varieties and fluctuations of meaning to give place to an habitual meaning characterized by our observers as a 'familiar feel.' (3) Meaning may lapse suddenly or die out gradually: the course of experience in the latter case is obscure.

## XLV. The Adjustment of the Hering Color-Blindness Apparatus

By M. Cowdrick and M. Winfield

Some years ago the senior editor of these studies published a note of inquiry[1] concerning an *Anweisung* or set of directions for the adjustment of the Hering Color-Blindness Apparatus, whch had been mentioned by Hering in his description of the apparatus[2] but which had never been obtained by the Cornell Laboratory. Efforts to procure it from Hering himself, from Rothe and from Spindler and Hoyer, the earlier and later manufacturers of the instrument, and from other promising sources had failed; and a request was made for the loan of it, if it were possessed by any reader of the *Journal.* Thus far no reply to the request has been received; and we have therefore undertaken to determine for ourselves what adjustments of the apparatus facilitate the performance of a test for color-blindness,

[3] For other instances of the meaning of strangeness, see Messer, *loc. cit.*

[1] E. B. Titchener, Laboratory Notes, this *Journal,* xxv, 1914, 298.

[2] E. Hering, Zur Diagnostik der Farbenblindheit, *Arch. f. Ophthalm.,* xxxvi, 1, 1890, 217.